

CHAPTER 77 EVALUATE FAR PART 121 EMERGENCY EVACUATION/DITCHING PROCEDURES/DEMONSTRATIONS

Section 1 Background

1. PTRS ACTIVITY CODES

- A. *Maintenance:* 3308
- B. *Avionics:* 5308
- C. *Cabin Safety:* Pending

3. OBJECTIVE. This chapter provides guidance for conducting FAR Part 121 emergency evacuation and ditching demonstrations.

5. BACKGROUND

A. *Definitions*

(1) *Dark of Night:* A level of illumination approximating the natural level of light that occurs 90 minutes after official sunset under clear sky conditions.

(2) *Extended Over-Water Operations:* Flights conducted at a horizontal distance of more than 50 nautical miles from the nearest shoreline.

(3) *Passengers:* Participants in the demonstrations who represent aircraft passengers. These individuals may not be crewmembers, mechanics, or training personnel.

B. *FAR Part 121 Demonstrations*

(1) FAR Part 121 operators must conduct an emergency evacuation demonstration for any aircraft having a seating configuration of more than 44 passenger seats.

(2) A ditching demonstration must be conducted for any land aircraft intended for extended overwater operations.

(3) The need to conduct full-scale or partial demonstrations depends primarily upon whether a full-

scale demonstration has been conducted previously by another FAR Part 121 operator or a manufacturer.

(4) The demonstrations test the following:

- The operator's emergency training program
- Crewmember competency
- The operator's emergency evacuation and ditching procedures
- The reliability and capability of the emergency equipment on the aircraft

C. *Manufacturer Demonstrations*

(1) Aircraft manufacturers must conduct emergency evacuation demonstrations to obtain type certification. These demonstrations are the responsibility of the FAA Aircraft Certification Office (ACO).

(2) The demonstrations test the following:

- The basic aircraft design
- The efficiency with which passengers can be safely evacuated from the aircraft
- The aircraft's emergency evacuation systems
- The manufacturer's FAA-approved emergency evacuation procedures

D. *Regulatory Requirements.* FAR §§ 121.291, 25.803, and Part 121, Appendix D specify four types of evacuation demonstrations:

- Full-scale emergency evacuation

- Partial emergency evacuation
- Full-scale ditching
- Partial ditching

E. *Maximum Demonstrated Seating Capacities.* To determine whether full-scale or partial emergency evacuation demonstrations are required, the Aviation Safety Inspector (ASI), must know the maximum number of passenger seats for specific air transport category aircraft used in FAR Part 121 operations. This information, along with data regarding interior configurations and other relevant factors, can be obtained through the following offices:

- The Seattle Aircraft Evaluation Group (ANM) for large aircraft
- The Central Aircraft Evaluation Group (ACE) for small aircraft
- The Southwest Aircraft Evaluation Group (ASW) for helicopters

7. FULL-SCALE EMERGENCY EVACUATION DEMONSTRATION. A full-scale emergency evacuation demonstration simulates an aborted takeoff. The operator must show that the aircraft, emergency equipment, and emergency procedures allow the evacuation of the aircraft at full seating capacity, including crewmembers, in 90 seconds or less.

A. An operator must conduct a full-scale emergency evacuation demonstration when there has been no previous demonstration of the aircraft type and model by another FAR Part 121 operator or by a manufacturer during type certification.

B. A demonstration is required if an operator proposes to increase seating capacity for a type and model of aircraft beyond that which has been previously demonstrated.

C. Under certain circumstances described in FAR § 25.803, the Aircraft Certification Office may designate

installed passenger seats to be unoccupied for a manufacturer's demonstration. However, the number of passengers a FAR Part 121 operator may carry is the total number of passengers occupying seats during a full-scale evacuation demonstration and not the number of installed passenger seats.

9. PARTIAL EMERGENCY EVACUATION DEMONSTRATION. The partial demonstration simulates an aborted takeoff and requires that the flight attendants occupy their normal takeoff positions before the demonstration begins.

A. After the initiation signal, the aircraft's emergency evacuation equipment and 50 percent of the required emergency exits and slides must be ready for use in 15 seconds or less. No passengers are used in a partial demonstration.

B. A partial demonstration is required when an operator intends to add to the operation a type and model of aircraft for which either a FAR Part 121 operator or an aircraft manufacturer has conducted a full-scale emergency evacuation demonstration.

(1) *Number.* A partial demonstration is required if:

- A change in seating configuration requires the addition of a flight attendant
- Changes in seating capacity result in fewer or the same number of flight attendants, but the flight attendant duties and procedures change significantly

(2) *Location.* If an operator changes a flight attendant seating assignment, the ASI must determine if the flight attendant's duties and responsibilities change significantly. A significant change requires a partial demonstration.

(3) *Duties and Procedures.* If an operator makes significant changes in emergency evacuation duties or procedures, the ASI may determine a partial demonstration to be necessary. If the changes are minor or can be addressed in the operator's training program, a demonstration may not be required.

(4) *Determining "Significant Change".* The ASI must consider the following in determining the degree and significance of changes:

- Flight attendant knowledge and experience
- The operator's training program
- The increase in complexity of flight attendant duties in terms of additional exits, seats, or briefing responsibilities

C. The need for a demonstration must be coordinated with the appropriate Aircraft Certification Office and AFS-1 when the operator changes the following:

- The number, location, and/or type of emergency exits
- The type of opening mechanisms on the emergency exits

11. FULL-SCALE DITCHING DEMONSTRATION

The ditching demonstration simulates a planned water landing and evaluates the operator's ability to prepare passengers, aircraft, and ditching equipment.

A. During the demonstration the following areas are evaluated:

- The emergency training program
- Ditching procedures
- Crewmember competency
- Equipment reliability and capability

B. FAR § 121.291(d) requires an operator who intends to operate an aircraft in extended overwater operations to conduct a ditching demonstration. A full-scale ditching demonstration is necessary if no FAR Part 121 certificate holder has performed one for the proposed type and model of aircraft.

C. Passengers are used in ditching demonstrations only when required by an operator's procedures to assist in removing and launching liferafts. Passengers shall receive no instructions before the demonstration except for those contained in the operator's manual.

D. It is FAA policy to use an aircraft for all ditching demonstrations. An operator proposing to use a life-size mockup or a floating device to conduct the demonstration must first have the approval of AFS-1.

E. Stands must be in place at each emergency exit and wing. During type certification, ditching emergency exits must be above the calculated waterline which would exist were the aircraft at rest in the water. The operator should obtain waterline and ditching exit information from the manufacturer. The tops of the stands must be positioned at the calculated waterline.

F. Regulations do not specify a maximum time limit for the demonstration. However, six minutes is considered the maximum time acceptable to prepare for ditching, from the ditching announcement to the simulated water landing.

13. PARTIAL DITCHING DEMONSTRATION. FAR § 121.291(e) allows an operator to conduct a partial ditching demonstration if a full-scale ditching demonstration for the proposed type and model of aircraft has been conducted by another FAR Part 121 operator.

15. MANUFACTURER-CONDUCTED DEMONSTRATION. Manufacturers of transport category aircraft having more than 44 passenger seats must conduct a full-scale demonstration in order to be issued a type certificate. The manufacturer's demonstration must be conducted according to the requirements of FAR § 25.803.

A. The Aircraft Certification Office (ACO), has primary responsibility for planning, conducting, and evaluating manufacturer emergency evacuation demonstrations.

B. The requirements of FAR § 25.803 were upgraded to be equivalent to those required by FAR Part 121. This was done so that one demonstration would suffice for both the issuance of an aircraft type certificate and compliance with the operational requirements of FAR § 121.291. Coordination with Flight Standards personnel is necessary to ensure compliance with operational requirements.

(1) If the manufacturer wants the demonstration to serve both the certification requirements of FAR § 25.803(c) and the operational requirements of § 121.291(a), the demonstration shall be conducted according to FAR Part 121, Appendix D.

(2) AFS-200 and the Aircraft Certification Office must concur on the acceptability of the manufacturer's plan.

(3) Flight Standards personnel must participate in the actual demonstration.

(4) In the absence of U.S. purchasers for an aircraft, crewmembers used in a manufacturer's evacuation demonstration must be trained in a program similar to the emergency evacuation portion of training programs approved under FAR Part 121. This ensures that the full-scale evacuation demonstration will also meet the requirements of FAR § 121.291.

17. INCREASING SEATING CAPACITY BY ANALYSES AND TESTS, FAR § 25.803(D)

A. Use of Analysis and Test Data. A combination of analyses and tests may be used to show that an aircraft can be evacuated within 90 seconds under the conditions specified in FAR § 25.803(c). The analysis and test data must show that the emergency evacuation capability is equivalent to that shown in an actual demonstration. If the Administrator accepts the data, a demonstration need not be conducted.

B. Limitations of Test Data. FAA policy prohibits the use of analyses and tests to increase seating capacity more than five percent above that established by a full-scale evacuation demonstration.

C. Approval of Test Data. A five percent increase in seating capacity cannot be approved without the analyses and test data being evaluated by the Aircraft Certification Office. AFS-1 will forward any request to increase up to five percent through the analysis and test method to the appropriate Aircraft Certification Office.

D. Restrictions. The operator is not allowed, under any circumstances, to increase passenger capacity beyond the maximum exit capacity of the aircraft.

19. PARTICIPANTS

(1) *Representative Passenger Complement.* In a full-scale aborted takeoff emergency evacuation demon-

stration, the operator must assemble a representative passenger complement. Before conducting the demonstration, the operator must ensure that the participants meet the appropriate criteria. If participants do not meet the criteria, the operator must repeat the demonstration.

(a) Participants must be representative of a normal passenger complement as follows:

Passenger	Age	Percentage of full seating capacity
Adult Females.....	12-60	30% minimum
Adult Males	12-60	50% to 60%
Adult Males and Females (proportional mix).	over 60	5% minimum
Children (prorated by age).	3-11	5% to 10%
Life-sized dolls	-	3 each

(b) The "life-sized dolls" referred to above must be carried by passengers to simulate infants two years old or younger.

(c) No employee of a certificate holder or manufacturer may be seated next to an exit.

(d) Because of child labor laws in some localities, it may not always be possible to have children between the ages of three and 11 participating in full-scale evacuation demonstrations. In these situations, a proportional mix of the overall passenger complement may be substituted.

(f) The operator may not practice, rehearse, or describe the demonstration for the passengers, nor may any participant have taken part in this type of demonstration within the preceding six months.

B. Company Officials. Company officials, such as Directors of Operations and Maintenance, must be available at the site of the demonstration.

(1) The company officials present must have the authority to modify the demonstration plan on site.

(2) They must be able to respond to FAA requirements for specific corrective actions for deficiencies that occur during the demonstration.

(3) Company personnel may observe the demonstration, but the company must ensure that these persons do not pose a distraction or affect the demonstration's outcome.

C. *Safety Personnel.* The company should provide safety personnel at strategic locations around the aircraft to protect passengers. Safety personnel may not assist crewmembers or otherwise participate in the evacuation. Safety personnel are used only to prevent passenger injury.

D. *Non-Company Personnel.* Non-company individuals who are not FAA employees must have specific reasons to observe the demonstration. Usually, these individuals will be representatives of the aircraft manufacturer, manufacturers of equipment used during the demonstration, or other organizations with a direct interest in aviation safety. The operator is responsible for all non-FAA personnel observing the demonstration.

E. *Crewmembers*

(1) *Flight Deck.* The flight crew must be qualified in the aircraft to be used. However, they need not have completed the initial operating experience requirement.

(2) *Flight Attendants.* Flight attendants must have completed an FAA-approved training program and passed a written or practical examination on the type of aircraft, emergency equipment, and procedures. Flight attendants may not be provided additional emergency training or become familiarized with equipment before the demonstration.

F. *FAA Personnel.* FAA observers should be limited to the following:

- ASIs from other offices whose operators will be acquiring the same or similar type aircraft as the one being demonstrated

- Regional or Headquarters officials or designees
- FAA personnel from the Certification Directorate, the Flight Operations Engineering Board, the Aircraft Evaluation Group, or any other FAA office concerned with technical or engineering components of the aircraft

21. SELECTING EXITS

A. *Calculating the Number of Usable Exits*

(1) In aircraft with an even number of exits, no more than 50 percent of the total number of exits and slides may be opened and deployed.

(2) If an aircraft has an odd number of emergency exits, subtract one; 50 percent of the remaining number of exits shall be used in the demonstration.

(3) All other exits must be blocked.

B. Any emergency exit assigned to flight attendants as part of their evacuation duties may be selected for use during the demonstration, provided they are designated as primary exits in the company's evacuation procedures.

C. Ventral (stairs) and tailcone exits should not be used unless they are paired with another exit. If there is any doubt as to which exits are paired, consult the Aircraft Certification Office responsible for the type certificate of the aircraft make and model.

D. One from each pair of exits should be selected. Exit pairs should be identified by the operator in the interior configuration diagram.

E. *Partial Demonstrations.* Only the flight attendant's primary exits, as designated by the operator's manual, may be used during partial demonstrations.

(1) FAR § 121.291(c)(1) requires that during a partial emergency evacuation demonstration, 50 percent of the floor level and 50 percent of the non-floor level exits be opened.

(2) A secondary door or exit that could not possibly be opened and ready for use in 15 seconds should not be selected.

23. METHODS OF BLOCKING EXITS. The following are examples of acceptable methods of blocking exits:

A. Position ASIs inside the aircraft at each door or window exit before starting the demonstration. When the evacuation is initiated, ASIs positioned in front of exits to be opened shall move away from their positions as quickly as possible. ASIs positioned in front of blocked exits shall raise their hands and state, "This exit is blocked." This is the most effective method for blocking overwing exits.

B. Cover each door window and window exit with a swatch of red cloth. Secure a line to the cloth long enough to reach the ramp or hangar floor. At the initiation signal, designated ASIs will pull the lines to uncover the door windows and window exits that are to be used. Doors and windows that are not to be used will remain covered.

C. On the outside of the aircraft, rig red lights in front of the door windows and window exits. When illuminated, these simulate a fire at blocked exits. The lights must be illuminated simultaneously.

25. INITIATION SIGNAL. All team members must be aware of the initiation signal. The initiation signal should be the same both inside and outside of the aircraft.

A. The preferred method of initiation is for a company employee to interrupt the aircraft's normal source of power by one of the following actions:

- Disconnecting or turning off an external source of power or a ground power unit
- Disconnecting or turning off the auxiliary power unit

B. These actions provide a clear initiation signal in the following ways:

(1) Inside the aircraft, the flight attendants and FAA team members will observe the normal cabin lighting extinguish and the emergency lighting system illuminate. This is their signal to begin the evacuation demonstration.

(2) Outside the aircraft, FAA observers and the team leader will observe the external lights extinguish. This signal initiates the timing and other necessary observation actions of the FAA team.

27. UNSATISFACTORY DEMONSTRATIONS. The severity and basic cause of the deficiency must be considered. Minor deficiencies usually can be resolved by responsible company personnel without having to declare the demonstration unsatisfactory.

A. A demonstration is unsatisfactory if the operator fails to meet the specified time limit.

B. Crewmember ineffectiveness or equipment malfunctions may be grounds for declaring a demonstration to be unsatisfactory.

C. If a relatively severe deficiency occurs due to improper company training, procedures, or maintenance, the demonstration should be declared unsatisfactory.

Section 2 Procedures

1. PREREQUISITES AND COORDINATION REQUIREMENTS

A. Prerequisites

- Knowledge of the regulatory requirements of FAR §§ 25.803(c), 121.291, and Part 121, Appendix D

- Successful completion of the Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent

B. *Coordination.* This task requires coordination with Operations ASIs and the Regional Office. It may require

coordination with the appropriate Aircraft Certification Office (ACO), and with AFS-1.

3. REFERENCES, FORMS, AND JOB AIDS

A. References

- Advisory Circular 121-24, Passenger Safety Information Briefing and Briefing Cards, as amended

B. Forms

- FAA Form 8430-1 Revised

C. Job Aids. None

5. PROCEDURES FOR EMERGENCY EVACUATION DEMONSTRATION

A. *Determine the Need for an Emergency Evacuation Demonstration.* The principal inspector or Certification Project Manager must determine if a demonstration is required.

(1) An emergency evacuation demonstration is required when an operator proposes operating a specific aircraft type and model when:

- Entering an aircraft into service for the first time (for a new or existing operator)
- A significant change occurs in the number of flight attendants, their seating locations, their evacuation duties or emergency procedures
- There is a change in the number, location, or type of emergency exits, or type of opening mechanism on the emergency exits

NOTE: If an operator proposes to operate an aircraft configured with less than 44 seats, even though the aircraft may have been previously type certified with more than 44 seats, no demonstration is required.

(2) A full-scale demonstration is required when:

- The aircraft type, model, and proposed seating capacity have not been previously demonstrated either by a manufacturer or by another U.S. operator
- The aircraft has undergone a change in its exit configuration and/or design (as determined by AFS-1)

(3) A partial demonstration is required when:

- An aircraft new to the operator has had a full-scale demonstration conducted by a FAR Part 121 operator or manufacturer for the maximum seating configuration proposed by the operator acquiring the aircraft
- The operator is undergoing original certification
- The principal inspector determines whether a significant change has occurred in the number of flight attendants, their locations, or their duties and procedures
- AFS-1 determines if a change has occurred in seating configuration, exits, or the aircraft's design that would require a partial demonstration

B. *Notify the Operator of Requirement.* Advise the operator in writing that an emergency evacuation demonstration is required. The operator must submit a plan for conducting the demonstration.

(1) The operator should submit the plan at least 30 working days in advance of a full-scale demonstration and 15 working days in advance of a partial demonstration.

(2) The operator's plan shall contain a letter of request which states the following:

- The applicable regulation which requires that a full-scale or partial emergency evacuation demonstration be conducted

- The aircraft type and model, specifying the full seating capacity (including crewmembers) to be demonstrated
- The number of flight attendants to be used during the demonstration
- The proposed date, time, and location of the evacuation demonstration
- The name and telephone number of the company's evacuation demonstration coordinator
- A statement that the representative passenger complement meets the requirements in FAR Part 121, Appendix D(a)(7)
- A description of how the operator proposes to initiate the demonstration
- A description of the timing signal
- A description of how the operator intends to block exits

(3) A diagram shall be included in the plan, representing the aircraft to be demonstrated. The diagram must show the following:

(a) The location and designation of all exits by type and the designated exit pairs

(b) The assigned seating location of each required crewmember during takeoff

(c) The interior cabin configuration, showing the location of individual passenger seats, galleys, aisles, lavatories, and passenger compartment partitions and bulkheads

(d) The location and type of emergency equipment on the aircraft, including:

- Fire extinguishers

- Portable oxygen bottles/masks
- Megaphones
- Crash axes
- Emergency ropes/tapes
- Liferafts/sliderafts
- Individual flotation devices or life preservers
- First aid and medical kits

(4) The plan must contain copies of the following documents:

- The appropriate crewmember manual pages describing emergency evacuation duties and responsibilities
- A copy of the passenger information card to be used on the aircraft during revenue operations

(5) The operator's plan must include the following additional information:

- A description of the emergency equipment installed on the aircraft, including the type and model of each item, as applicable
- A list of crewmembers qualified to participate in the demonstration
- A description of how the operator will ensure that the demonstration is conducted in the dark of the night or in conditions simulating the dark of the night
- A description of how the operator will ensure that the aircraft is positioned in a location, either indoors or outdoors, which will allow the unobstructed deployment of all emergency evacuation slides or sliderafts, as applicable

C. *Evaluate Operator's Plan and Letter of Request.* Ensure that all necessary information is included in the submission. Respond to the operator's plan in a timely manner.

(1) Resolve minor omissions or deficiencies by contacting the company's evacuation demonstration coordinator.

(2) If the operator's plan has a significant number of required items or documents missing, return the entire submission to the operator with a written explanation as to why it is unacceptable. Advise the operator that the FAA will take no further action until an acceptable plan is submitted.

(3) Once all required elements have been submitted, analyze and evaluate the operator's plan. Ensure that the information is acceptable and consistent with the proposed type of demonstration.

(4) The principal inspector should ensure that:

(a) The operator's emergency training program has been approved by the FAA

(b) Evacuation procedures in the operator's manuals, including crewmember assignments, are realistic, practical, and in compliance with FAR § 121.397

(c) The passenger information card is understandable and consistent with the type and model of aircraft to be demonstrated

(d) The emergency equipment is acceptable for the type of operation proposed

(5) *Conduct Necessary On-Site Evaluation(s).* Certain items in the proposal may require on-site evaluation. Determine if the operator is making provisions for participant safety, including the use of safety observers, stands, padding, mats, and other appropriate measures.

(6) *Document Deficiencies.* Resolve deficiencies with the company's evacuation demonstration coordinator.

(a) If major discrepancies are found, or if the FAA and the operator are unable to resolve significant

issues, return the operator's plan with a letter of explanation. Inform the operator that the discrepancies outlined in the letter must be corrected and a plan resubmitted before the FAA takes further action.

(b) If the submission is acceptable, inform the operator that the plan has been accepted by the FAA.

D. *Assemble FAA Team Members*

(1) *Team Leader.* For an initial certification, the Certification Project Manager (CPM) serves as the demonstration team leader. For an existing operator, the district office manager will assign one of the operator's principal inspectors to serve as demonstration team leader.

(2) *Additional Team Members.* Remaining FAA team members will be assigned as needed. The team should include Operations, Maintenance, and Avionics ASIs familiar with FAR Part 121 operations and requirements.

E. *Conduct Predemonstration Meeting with Operator.* Meet with the operator's evacuation demonstration coordinator.

(1) Review the demonstration plan and ensure that the operator is thoroughly familiar with the criteria to be used during the demonstration.

(2) Review the training methods, the timing criteria, and the method and signals for initiating the demonstration.

(3) With the operator, determine the signal to be used to terminate the demonstration, such as an air horn or other clear and distinguishable audible signal. Agree upon a suitable device and test it to ensure its adequacy.

NOTE: Previous experience has shown that a whistle blast may not be adequate.

(4) Resolve any open questions or issues the operator may have before conducting the demonstration.

F. *Conduct the FAA Team Meeting*

(1) Provide specific team member assignments for the demonstration. Include the following:

- Timekeeping
- Position (inside or outside the aircraft)
- Inspecting the aircraft, emergency equipment, and any applicable documents

(2) Distribute an aircraft diagram to each ASI showing assigned locations for the demonstration.

(3) Determine which emergency exits shall be opened. Review the operator's proposal for blocking the remaining exits.

(4) Select typical crewmembers to be used in the demonstration from the list provided by the operator. Do not select the following:

- Persons used in previous demonstrations
- Emergency procedures instructors
- Supervisors
- Check airmen
- Union safety representatives
- Others who may have an above average level of competency or experience

(5) Review regulatory requirements and demonstration criteria.

G. Select Exits and Approve Blocking Method

(1) Carefully review the operator's emergency evacuation procedures. Determine the number of usable exits.

(2) One from each pair of exits should be selected.

(3) After selecting exits to be used, the team must ensure that the operator does not obtain that information.

(4) Once a method of blocking exits has been determined, notify the company's project coordinator of FAA concurrence with the method.

H. *Approve the Initiation Signal.* Ensure that all team members are aware of the initiation signal.

I. Perform a Predemonstration Inspection

(1) Ensure that the aircraft is configured and equipped for takeoff according to the operator's manuals and procedures.

(a) The aircraft must include the proposed full passenger seating configuration.

(b) All appropriate emergency equipment must be installed.

(2) Inspect each of the following items to ensure regulatory compliance with FAR Part 121:

- Hand-held fire extinguishers for crew, passenger, and cargo compartments
- Protective breathing equipment
- First aid equipment
- Crash axe
- Megaphones
- Interior emergency exit markings
- Flotation devices or life preservers
- Lighting for interior emergency exit markings
- Emergency light operation
- Emergency exit operating handles
- Emergency exit access

- Exterior exit markings
- Exterior emergency lighting and escape route
- Floor level exits
- Additional emergency exits
- Ventral or tailcone exits
- Portable lights
- Seats, safety belts, and shoulder harnesses
- Emergency Equipment required for extended overwater operations
- Public address system
- Passenger information signs/placards
- Aircraft fire detection and protection system (operational test)
- Passenger information cards
- Cockpit escape system
- Slides and sliderafts

(3) For partial emergency evacuation demonstrations, the slides may be beyond scheduled inspection criteria. The operator must request this option in the demonstration plan. The plan must state that the operator accepts full responsibility for any failure of the demonstration due to a malfunction of the slides. The FAA team leader must either accept or deny this proposal.

(4) In a full-scale demonstration, stands or ramps must be placed appropriately for use by evacuees to descend from the wing to the ground. If stands or ramps are to be used, they must be placed at both overwing exits to ensure that the operator does not learn which exits will be used.

(a) Inspect the stands and ramps for structural integrity and security.

(b) Inspect any other safety equipment, such as mats, placed on the ground to protect participants.

(c) Equipment which is not part of the aircraft's emergency evacuation system may not be used to aid participants in reaching the ground.

(5) Ensure that dark of night conditions exist in order to evaluate the following:

- The aircraft's emergency lighting system
- Passenger and crewmember performance in darkened conditions

(6) Ensure that the operator has the following present at the demonstration:

- Appropriate safety personnel to prevent passenger injury
- Company personnel with the authority to direct demonstration modifications as required by the FAA
- The minimum number of proposed flight attendants for use on the aircraft during FAR Part 121 operations. In no case shall this number be less than that specified in FAR § 121.391.
- For full-scale demonstrations, passengers meeting the criteria of FAR Part 121, Appendix D, (a)(7). See Job Aid 77-1.

J. Attend Predemonstration Briefings

(1) *Attend Crewmember Briefing.* Ensure that the company's evacuation demonstration coordinator provides crewmembers with specific information regarding the demonstration.

(a) The FAA team leader must attend this briefing to resolve any questions and ensure that the following items are discussed:

- The purpose of the demonstration
- The initiation signal which begins the demonstration
- The significance of the 90-second time limit for full-scale evacuations or the 15-second time limit for partial evacuations
- The signal to be used for stopping the demonstration
- The importance of safety during the demonstration, including crewmember responsibilities and safety observer duties and limitations

(b) Ensure that the crewmembers understand that any evacuation activity in progress must immediately cease with a “stop” signal.

(2) *Attend the Operator’s Passenger Briefing.* Ensure that prior to the demonstration, the company’s evacuation demonstration coordinator tells the passengers the following:

(a) The purpose of the demonstration is to evaluate how quickly the aircraft can be safely evacuated

(b) Passengers must pay attention to the flight attendants’ instructions

(c) Individual safety is not to be compromised at any time during the demonstration

(3) *Brief the FAA Team Members.* Remind FAA team members not to discuss the results of observations with persons other than the team leader. Review the following items before conducting the demonstration:

- The objectives of the demonstration

- The initiation signal
- Observer assignments with regard to exits to be used or blocked
- The signal to stop the demonstration

K. *Conduct the Demonstration*

(1) Advise the operator to board the passengers as routinely as possible and prepare for departure. No passenger may be assigned a specific seat unless the FAA team determines such assignments are in accordance with the operator’s normal boarding procedures.

(2) For both full-scale and partial demonstrations, ensure that the flight attendants accomplish the following:

- Prepare for a normal departure according to the operator’s procedures, including closing and securing all exits and galleys, and arming the emergency evacuation system for takeoff
- Conduct a passenger briefing in accordance with FAR § 121.571 and company procedures
- Sit at their assigned positions with restraint systems fastened

(3) Distribute a reasonable amount of carry-on baggage, blankets, pillows, and clothing in the aisles and emergency exit access ways to create minor obstructions.

(a) Carry-on luggage that will fit under a passenger seat, such as small suitcases, gym bags, aircraft flight bags, and briefcases, should be filled with clothes or newspapers and placed in the main aisles.

(b) There must be one bag per seat row for each aisle.

(c) Some bags should be placed in the aisles and passageways.

(d) Pillows and blankets should be scattered in the main aisles.

(4) Ensure that each external door and exit and each internal door or curtain is in position for a normal takeoff.

(5) Ensure that the flight crew accomplishes all tasks on appropriate checklists and configures the aircraft for a normal takeoff before the initiation signal is given. Ensure that the flight crewmembers are seated in their normal positions with restraint systems fastened.

(6) Before a full-scale evacuation demonstration, ensure that the aircraft's wing flaps are fully extended, if required by the operator's emergency evacuation procedures.

(a) Stands or ramps (if used) should be positioned accordingly.

(b) Wing flaps shall not be repositioned until after the demonstration.

(7) Ensure that after completing all required pre-takeoff actions, the captain informs the FAA team leader (positioned forward of the nose of the aircraft) by ground interphone that the aircraft is ready for takeoff.

(8) Ensure that all FAA team members and company safety observers (if used) are ready and in position.

(9) Issue a warning signal, which should precede the initiation signal by approximately 30 seconds.

(10) Instruct the company evacuation demonstration coordinator to initiate the demonstration.

(11) Begin timing with two stopwatches (a primary and a backup) when the external aircraft lights extinguish.

(12) For a full scale demonstration, each FAA observer assigned to an opened exit will count the passengers as they exit. After the termination signal, each observer will ensure that no passenger or crewmember remains on the aircraft or uses the exits. Should any passenger or crewmember remain on board or use an exit after the termination signal, the demonstration will be declared unsatisfactory.

(13) For a partial demonstration, each FAA observer assigned to an exit to be used will determine if the assigned exit was opened and each slide or slideraft was ready for use before the termination signal. Should any exit, slide, or slideraft remain not ready for use after the termination signal, the demonstration will be declared unsatisfactory.

(14) Team members assigned to the cabin must ensure that all required equipment worked properly during the demonstration.

(15) At the end of the appropriate time period, issue a clear, audible signal terminating the demonstration.

7. PROCEDURES FOR DITCHING DEMONSTRATION

A. Determine the Need for a Ditching Demonstration

(1) A full-scale ditching demonstration is required when the operator proposes to operate a specific aircraft type and model under the following circumstances:

- When no ditching demonstration has been performed for the proposed type and model of aircraft by another FAR Part 121 certificate holder
- When planning to initiate flights into extended over-water areas for the first time with an aircraft the operator has previously operated over land areas

(2) A partial ditching demonstration is required when the proposed type and model has been previously demonstrated by another FAR Part 121 operator.

B. Notify the Operator of the Requirement. Advise the operator in writing that a ditching demonstration is required. The operator must submit a plan for conducting the demonstration. ASIs must ensure that the operator understands which information and documents are required for the plan to be accepted for evaluation.

(1) If the operator plans to conduct the ditching demonstration in conjunction with an emergency evacuation demonstration, the operator's demonstration plan must include the following additional information:

- Type of ditching demonstration (full-scale or partial)
- Copies of the operator's manual relating to crewmembers' ditching duties and responsibilities
- A description of applicable emergency equipment used for ditching, including the type and model

(2) If the ditching demonstration is not conducted in conjunction with an emergency evacuation demonstration, the plan must be submitted at least 15 working days before the actual demonstration. The plan must include the information listed above and the following additional information:

- The aircraft model and type
- A list of all crewmembers who will participate in the demonstration
- The proposed date, time, and location of the demonstration
- The name and telephone number of the company's ditching demonstration coordinator

(3) A diagram shall be included in the plan, representing the aircraft to be demonstrated. The diagram must show the following:

(a) The location and designation of all exits by type and the designated exit pairs

(b) The location of emergency ditching equipment, including:

- Liferafts and/or sliderafts
- Survival radios
- Pyrotechnic signaling devices
- Passenger/crewmember life preservers or individual flotation devices

C. *Evaluate the Operator's Plan.* Review the proposal to ensure the following:

- The proposed demonstration will meet the criteria of FAR Part 121
- The emergency training program and ditching procedures in the operator's manual have been approved and accepted
- The operator's training program and ditching procedures provide for safe operating practices

D. *Assemble the FAA Team*

(1) If the ditching demonstration is conducted in conjunction with an emergency evacuation demonstration, the same team will observe and evaluate both demonstrations.

(2) If the ditching demonstration is conducted alone, the district office manager will appoint a Federal Aviation Administration ditching demonstration team and team leader.

E. *Perform Predemonstration Inspection.* Before the ditching demonstration begins, the team must inspect each item of emergency ditching equipment for compliance with appropriate airworthiness and other directives. Stands must be placed at each emergency exit and wing.

F. *Conduct the Demonstration.* The demonstration must be conducted during daylight hours or in a lighted hangar.

(1) Ensure that ASIs, crewmembers, and passengers, if required, are at their assigned positions. All required crewmembers must be available and used during the demonstration.

(2) Instruct the captain to commence the demonstration. The captain will initiate the demonstration by ordering the crewmembers to prepare for ditching.

(3) Begin timing when the captain announces to prepare for ditching.

(4) Observe crewmembers' preparation activities.

Within six minutes of the ditching announcement, crewmembers must accomplish the following:

- Correctly put on life preservers
- Brief passengers
- Secure the cabin
- Complete all required checklists
- Be prepared to evacuate

(5) At the end of six minutes, advise the captain to announce that the aircraft is in the water. At this time the crew must be prepared for a simulated water landing.

(6) Observe the deployment of the rafts. Ensure that all liferafts are removed from stowage within a reasonable period of time.

(a) For full-scale demonstrations, each liferaft and slideraft must be launched and inflated. All required emergency equipment must be placed in the rafts.

(b) For a partial ditching demonstration, one liferaft (or slideraft), designated by the FAA team leader, must be launched and inflated. On aircraft configured with sliderafts, it is not necessary to detach each slideraft from its door mounting. Any liferafts stowed inside the aircraft must be removed from stowage and placed on the cabin floor for inspection.

(7) Inspect each slideraft for airworthiness.

(8) Ensure that each evacuee enters a liferaft or slideraft.

(9) Ensure that crewmembers adequately locate and describe the use of each piece of emergency equipment in their assigned rafts.

(10) Question crewmembers about actual launch procedures.

9. EVALUATING EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS

A. *Evaluate the Demonstration.* After the demonstration, confer with FAA team members. Reach agreement on the results before discussing the demonstration with the operator.

(1) Evaluate the following areas of the demonstration:

- Crewmember compliance and effectiveness in performing assigned duties and responsibilities
- Flight crew effectiveness in exercising command responsibilities
- The coordination and communication between the flight crew and flight attendants
- The operation and airworthiness of emergency equipment. Note any deficiencies or delays caused by the emergency equipment.

(2) Ensure that each designated exit and slide was opened, deployed, and ready for use within appropriate time criteria.

(3) Ensure that the following occurred:

(a) For full-scale emergency evacuation demonstrations, designated exits and slides were properly operated and, if applicable, all passengers and crewmembers evacuated within 90 seconds.

(b) For a partial emergency evacuation demonstration, designated exits were opened and slides ready for use within 15 seconds.

(c) For ditching demonstrations, the cabin, passenger, and flight attendants were ready for a water landing within 6 minutes. Liferafts were efficiently removed from stowage. Each designated life vest, liferaft, and slideraft was properly inflated.

B. *Determine if Demonstration Was Unsatisfactory*

(1) A demonstration must be declared unsatisfactory if the operator fails to meet the specified time limit.

(2) A demonstration may be declared unsatisfactory for the following reasons:

- Crewmember ineffectiveness or equipment malfunctions
- The occurrence of a relatively severe deficiency due to improper company training, procedures, or maintenance

(3) If the inspection is unsatisfactory, determine if the problem can be corrected immediately.

(a) If the problem cannot be corrected immediately, reschedule the demonstration.

(b) If the problem can be corrected immediately, ensure that corrective action is taken.

C. Advise the Operator of the Results of the Demonstration. Once an agreement on the demonstration results has been reached, advise the applicant or operator of the results.

(1) If the results are unsatisfactory, issue a letter of disapproval to the operator or applicant.

(2) If the results are satisfactory, issue a letter of approval to the operator or applicant.

D. Complete Emergency Evacuation Demonstration Report. The team leader is responsible for preparation and distribution of the demonstration report. The report must include the following:

- FAA Form 8430-1, Emergency Evacuation Demonstration Report (see Figure 78-2). One form is required for each demonstration attempt.
- The passenger information briefing card
- A diagram of the aircraft, including emergency equipment, exits, exits used, the number of approved passenger seats, and the location of seats which were used by flight attendants

E. Distribute the Report. Forward a copy of the report to the regional Flight Standards Division. Retain the original package in the district office file.

11. TASK OUTCOMES

A. File PTRS Transmittal Form.

B. Completion of this task will result in one of the following:

- A letter of demonstration approval
- A letter of demonstration disapproval

C. Document Task. File all supporting paperwork in the operator's office file.

13. FUTURE ACTIVITIES. Normal surveillance.